Barrier Grouping 1

Current avoided cost price offered to renewable developer/producers may be insufficient

RENEWABLES DOCKET NO. 94-0226 COLLABORATIVE

IDENTIFIED BARRIERS AND STRATEGIES

Barrier Grouping 1 — **Current avoided cost price offered to renewable developer/producers may be insufficient.**

INTRODUCTION:

Most of the facilities used to generate and distribute electrical energy are owned by electrical utilities. However, some generation facilities, including most of Hawaii's renewable resources, are owned by non-utility, independent power producers. Federal law and state administrative rules establish mandatory guidelines regarding the prices that must by paid by utilities to independent power producers for power generated by renewable energy resources. In general, the price paid to a non-utility renewable energy producer is determined by the "avoided cost" of the power that otherwise would have to be generated by the utility.

The potential barriers listed in this section relate to the cost of developing the resource, and the price paid for power produced by the resource. A renewable resource will normally be developed only if the expected cost of producing power from the resource is less than the expected price for the power. The strategies addressed in this section include those that reduce the costs of renewable energy resources and those that would increase the price paid by utilities for power from renewables.

Barrier 1.a — Uncertainties regarding the applicability and availability of state income tax credits to renewable energy projects.

DEFINITION:

While the current law offers significant benefits to solar, wind, and ice storage developers through December 31, 1998, the Administration's attempt during the 1995 Legislature to repeal all state income tax credits creates some uncertainty. While these credits were not repealed, the possibility that they could again come under scrutiny remains. However, once a credit is earned, it is unlikely that it would be lost retroactively. However, even the discussion or proposal to eliminate tax credits or delay their implementation can potentially adversely affect plans for financing and developing renewable energy projects. Stability is required.

The uncertainty regarding applicability of Energy Conservation Income Tax Credits is primarily with respect to large-scale solar systems.

DISCUSSION:

Current State Law regarding energy tax credits is included in Act 319, which amended Section 235-12, HRS, in 1990, providing for individual or corporate income tax credits for solar or wind energy devices, heat pumps, or ice storage systems. Solar includes both solar water heating systems and photovoltaic systems. All of these systems can be effective demand-side management measures. The provisions are for systems installed and placed in service after December 31, 1989, but before January 1, 1999. The credits are as follows:

Renewable Energy System	State Income Tax Credit
Solar (Single Family Home)	35% or $1,750, whichever is less
Solar (Multi-Unit Primarily Residential Dwelling)	35% or $350 per unit if system provides not less than 80% of daily annual hot water needs of all building occupants
Solar (Hotels, Commercial, and Industrial Facilities)	35% of actual cost of system
Wind	20% of actual cost of system
Ice Storage	50% of actual cost of system

All tax credits apply only to the actual cost of the solar, wind, heat pump, or ice storage system, including accessories and installation. The tax credit shall be claimed against net income tax liability for the year in which the energy system was purchased and placed in use in Hawaii. Tax credits that exceed the taxpayers income tax liability may be used as a credit against the taxpayer's income tax liability in subsequent years until exhausted. The credits are not refundable.

The uncertainty regarding Energy Conservation Income Tax Credits is primarily with respect to large-scale solar systems. HRS §235-12 (b) (4) Energy Conservation; income tax credit, as it is currently written, appears to provide a thirty-five per cent income tax credit to solar systems for existing hotel, commercial, and industrial facilities, regardless of system size.

A solar energy system is defined in §235-12 (e) as "any new identifiable facility, equipment, apparatus, of the like that converts solar insolation ... to useful thermal or electrical energy for heating, cooling, or reducing the use of other types of energy dependent upon fossil fuel for their generation."

STRATEGIES:

Strategy 1.a.1 Seek clarification from Department of Taxation (DoTax) regarding applicability of existing tax credits to large RE facilities.

DISCUSSION:

If uncertainties have been identified, then a request should be made to the State Department of Taxation to clarify the applicability and availability of state income tax credits to large-scale renewable energy projects.

VEHICLE: Draft letter requesting DoTax clarification.

AGENCY: DBEDT

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, ki, m, h, n, r, z

OPPONENTS:

NO POSITION: p, w, krl, i, ca, ers

Strategy 1.a.2 Support and maintain existing RE tax credits to the extent appropriate.

DISCUSSION:

Stability of incentive is required for developers' financial planning.

The State of Hawaii currently offers income tax credits to developers of wind and solar energy projects under HRS §235-12 (b) (4) Energy Conservation; income tax credit. A thirty-five percent income tax credit is provided for solar energy systems, and a twenty per cent income tax credit is provided for wind energy systems. These income tax credits are effective for solar and wind energy systems placed in service after December 31, 1989, but before January 1, 1999.

The State administration made an attempt to eliminate energy conservation income tax credits during the 1995 legislative session. Proponents of the tax credits maintain that they not only conform to State Policy but have a net economic benefit in terms of (1) reduced oil imports and energy consumption, and (2) the maintenance of local industry. The attempt to eliminate tax credits was unsuccessful. However, the governor has stated that these tax credits will be subject to further review and possible elimination during the 1996 legislative session. Thus, solar and wind energy developers cannot absolutely rely on these tax credits being in effect for any development projects in the near future.

VEHICLE: Monitor and support appropriate legislation.

AGENCY: DBEDT and DoTax with supporting analysis/testimony from Counties, Utilities, Consumer Advocate, and RE developers.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, r, p, ki, m, h, w, n, krl, i, ers, z

OPPONENTS:

NO POSITION: ca

Strategy 1.a.3 Examine the efficacy of additional State incentives to encourage RE.

a. Seek Legislation for performance-based or production tax credits, similar to Federal production credits for RE (1.5¢/kWh).

DISCUSSION:

Some renewable energy projects may earn little or no income, making a direct payment production incentive more effective than a tax credit incentive in encouraging renewable energy development.

b. Broaden law to offer tax credits for all renewable energy technologies; e.g., energy-dedicated biomass crops.

c. Extend the duration of existing tax credit programs for ten years or increase period to 15 years.

d. Eliminate the minimum hot water production percentage requirements for solar and heat pump water heating systems for multi-unit residential buildings and make the percentage and limits of the tax credits equivalent to those provided for single family residences.

e. Establish RE Enterprise Zones in conjunction with renewable resource subzones. Where RE Enterprise Zones are established provide tax incentives to RE facility developers, irrespective of facility ownership.

VEHICLE: Establish working group to examine the efficacy of additional State incentives to promote renewable energy resources.

AGENCY: DBEDT, Developers, Utilities, General Public

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, r, p, ki, m, h, n, krl, i, ers, z

OPPONENTS:

NO POSITION: w, ca

Barrier 1.b Cost effectiveness of RE resources.

DEFINITION:

Certain renewable resources (and certain potential renewable projects) are not or do not appear to be "cost-effective" (from a "utility cost" perspective) at this time.

DISCUSSION:

A resource is cost-effective, in this context, if the expected life-cycle costs of developing, owning and operating a generating facility that uses the resource are less than the expected life-cycle revenues for power generated by the facility (from the perspective of the developer of the resource). In general, the "market" (i.e., developers of renewable resources) will determine whether the expected cost of implementing a particular renewable resource is less than the expected price.

There is consensus that this is a barrier to the deployment of facilities utilizing such resources. There is no consensus as to which renewable resources are cost-effective at this time.

STRATEGIES:

Potential strategies include, but are not limited to:

Strategy 1.b.1 Pursue the deployment of renewables that appear to be currently cost-effective, and monitor the progress of renewables that show promise of becoming cost-effective in the future.

VEHICLE: Power purchase negotiations.

AGENCIES: Utilities, RE developers, PUC.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, p, ki, m, h, w, n, krl, i, ers, r, z

OPPONENTS:

NO POSITION: ca

Strategy 1.b.2 Improve the cost-effectiveness of renewable resources through RD&D.

DISCUSSION:

Research, development and demonstration ("RD&D") strategies are discussed under barrier grouping 9.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, ki, m, h, n, r, z

OPPONENTS:

NO POSITION: p, i, krl, w, ers, ca

Strategy 1.b.3 Increase/refocus the government tax incentives currently available.

DISCUSSION:

State tax incentive strategies are discussed under barrier 1.a.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, n, r, z

OPPONENTS:

NO POSITION: p, krl, w, i, m, h, ers, ki, ca

Strategy 1.b.4 Provide government support in addition to government tax incentives (to expedite permitting, to make government award sites available, etc.).

DISCUSSION:

The cost and risk (which increases the required return on investment) of developing RE projects are affected by the substantial time and resources necessary to acquire permits and/or access to public sites for RE projects. Strategies related to expediting and/or simplifying permitting for RE projects and related to expediting and/or simplifying access to public sites for RE projects are discussed under barrier grouping 3.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, n, z

OPPONENTS:

NO POSITION: p, krl, w, i, m, k, h, ca, ki, ers

Strategy 1.b.5 Develop and implement a green pricing tariff.

DISCUSSION:

Generally, "green pricing" is a utility rate option under which ratepayers would be given the option of paying "marginally" higher rates in exchange for the utility's commitment to utilize the difference to acquire new renewable resources. This strategy is discussed under strategy 1.e.2.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, r, p, ki, m, h, n, krl, i, ca, ers, z

OPPONENTS: w

NO POSITION:

Strategy 1.b.6 Energy Wheeling for Counties.

DISCUSSION:

Proponents maintain that for the Counties certain RE resources could be cost effective if wheeling services were provided by the utilities. For example, remote wind turbine generators could match the needs of some of the Counties' water pumping facilities, particularly those with excess reservoir capacity and/or back up generators. While it may not be cost-effective to sell wind power to the utility at wholesale rates and repurchase the power at retail rates, it may be feasible and cost-effective to utilize the wind power through a wheeling arrangement using a reasonable wheeling rate. This wheeling arrangement would only apply to the counties because the counties have the statutory authority to develop renewable energy resources for county facilities.

Opponents of providing wheeling services to the counties maintain that (1) before including retail wheeling as a possible strategy to encourage the development of renewable resources, the pros and cons of retail wheeling must be examined in their broader context, (2) retail wheeling could result in "cream skimming" by the non-utility generators, and (3) providing wheeling services to only the counties would discriminate against other customers (e.g. the state and federal government). Wheeling is discussed in barrier grouping 7.

VEHICLE: PUC proceedings to establish a wheeling tariff for the Counties.

AGENCY: PUC, Utilities, Consumer Advocate, Counties

POSITION OF THE PARTIES:

PROPONENTS: p, i, w, krl, h, ki, r, m, ers, z

OPPONENTS: heco, he

NO POSITION: ca

Strategy 1.b.7 Net Billing Payment Rates for Small RE Systems

DISCUSSION:

Under a Net Billing System ("NBS") each kilowatt-hour of electricity consumed by a customer with a small renewable generating system, such as a residential photovoltaic ("PV") system, is offset, on a one-to-one basis, by each kilowatt-hour of surplus power exported by the customer to the grid. It uses a single meter to measure both electricity purchased from and sold to the utility over a given billing period, using a "reverse the meter" approach. The customer pays the bill for net energy consumed, or receives either a payment or a carry-over credit for net energy produced. Payment for net energy produced during the billing period is at the lower "avoided cost" rate, rather than the retail rate.

Proponents maintain that net billing is a viable demonstration strategy for small scale renewable energy systems because it (1) improves the cost-effectiveness of renewable resources by stimulating market demand, thereby helping to lower production costs, and (2) lowers the cost of demonstrating the performance of distributed systems by leveraging the utilities resources with private investment.

Opponents maintain that (1) net billing would create a subsidy from nonparticipants to NBS customers, (2) the subsidy would distort the market for NBS's, causing customers to install NBS's when they are not cost-effective, (3) net billing would result in payments to NBS energy suppliers above the utility's avoided costs, since the utility's retail energy rates generally include part of the utility's customer (metering, billing, etc.) and demand (generation, distribution and transmission) costs, and these costs are not avoided when the utility purchases energy back from the customer, and (4) may violate FERC's avoided cost cap rulings application to QFs.

VEHICLE: PUC rule-making.

AGENCY: PUC

POSITION OF THE PARTIES:

PROPONENTS: p, krl, i, ers, m, r, h, ki, d, z

OPPONENTS: heco, ke

NO POSITION: ca

Barrier 1.c Unresolved avoided cost issues.

DEFINITION:

The "unresolved" question is whether the avoided cost price offered/paid to renewable energy producers actually equals the electric utilities' avoided costs.

DISCUSSION:

Utilities are required to purchase power from Qualifying Facilities at or below their avoided costs (unless a different price is negotiated) pursuant to the Public Utility Regulatory Policies Act of 1978, as amended ("PURPA"), and the Commission's Standards for Small Power Production and Cogeneration in the State of Hawaii (H.A.R. Title 6, Chapter 74), (the PUC's "Avoided Cost Rules"), which implement PURPA and H.R.S. §269-27.2.

As defined in the PUC's Avoided Cost Rules, "avoided costs" means the "incremental or additional costs to an electric utility of electric energy or firm capacity or both which costs the utility would avoid by purchase from the qualifying facility". H.A.R. §6-74-1.

Avoided costs are comprised of two components -- avoided capacity costs and avoided energy costs. Avoided capacity costs include avoided capital costs (e.g., return on investment, depreciation and income taxes) and avoided fixed O&M costs. Examples of costs that may be included in the avoided capacity cost component are firm generating capacity costs, T&D capital costs, fixed O&M costs, and T&D demand losses.

Avoided energy costs include avoided fuel costs and avoided variable O&M costs, as well as avoided working cash, avoided fuel inventory and avoided T&D energy losses.

There is no consensus as to whether there is a barrier, or as to the answer to the "unresolved" question. Proponents maintain that avoided cost payment rates understate or may understate a utility's actual avoided costs with respect to renewable resources. Opponents maintain that avoided cost payment rates overstate or may overstate a utility's actual avoided costs.

In general, the questions under this barrier include (1) whether intermittent renewable resources should be paid for avoided capacity costs (i.e., whether "as-available" renewable resources should be paid a capacity adder), and (2) whether the calculation of avoided costs adequately captures the benefits of small, dispersed increments of as-available resources (i.e., whether the avoided cost calculation includes avoided transmission and distribution ("T&D") losses).

Related barriers include (1) barrier 1.e., which addresses the evaluation and consideration of the beneficial impacts of renewable energy use relative to conventional fossil fuel resources in setting power purchase rates, (2) barrier 5.f., which addresses the evaluation and consideration of the beneficial impacts of renewable energy use relative to conventional fossil fuel resources in IRP, (3) barrier 5.e., which addresses the evaluation and treatment of renewable energy resources and independent power producers ("IPPs") in the Integrated Resource Planning ("IRP") process, and (4) barrier 1.f., which addresses the inability of utility operation models and economic models to accurately and adequately model and evaluate renewable energy systems.

STRATEGIES:

Possible strategies include but are not limited to:

Strategy 1.c.1 Reduce the uncertainty regarding avoided costs.

DISCUSSION:

There are pending PUC dockets regarding the determination of short-run avoided energy costs for as-available resources (Docket No. 7310) and of long-run avoided costs for firm capacity resources (Docket No. 94-0079). Resolution of these dockets by the PUC will substantially reduce any uncertainty regarding the determination of avoided costs.

VEHICLE: Resolution of pending PUC dockets regarding the determination of short-run avoided energy costs for as-available resources (Docket No. 7310) and of long-run avoided costs for firm capacity resources (Docket No. 94-0079).

AGENCY: PUC.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, p, ki, m, h, w, n, krl, i, ers, r, z

OPPONENTS:

NO POSITION:

Strategy 1.c.2 If any avoided capacity costs can be reasonably demonstrated for an as-available resource, the amount of these avoided costs (or some proxy) should be included in determining the value and pricing of the resource.

DISCUSSION:

Some, but not all, as-available renewable generation resources may result in a limited amount of deferral or reductions in utility capital costs. To the extent that any such costs can be reasonably demonstrated, including these costs in the selection of resource mix and the negotiation of power purchase contracts would more accurately represent the full value of these renewable resources. The PUC would have to determine what terms and conditions should be included in PPAs for as-available energy producers for such producers to qualify.

VEHICLE: IRP process, Power purchase contract negotiations

AGENCY: Utilities, Renewable developers, PUC

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, p, ki, m, h, w, n, krl, ers, ca, i, z

OPPONENTS:

NO POSITION:

Strategy 1.c.3 Perform an analysis of the combined effects of a variety of distributed renewable energy projects in a given service territory.

DISCUSSION:

As part of Phase 3 of the Renewable Energy Resource Assessment and Development Program conducted by R. Lynette & Associates ("RLA") under contract to DBEDT, RLA conducted analyses aimed at identifying the value of intermittent renewable resources to utilities. See RLA, Renewable Energy Integration Plan §4 (Draft March 17, 1995). The analyses include illustrations of utility load matching with renewable energy project output on a diurnal and seasonal basis.

A combination of similarly-sized wind energy projects at different locations might allow significantly more wind energy development in this area than would ordinarily be considered to be feasible or be accepted by the utility.

A computer model has been developed for DBEDT which allows a comparison of utility demand curves with the projected output curves of a variety of renewable energy projects, both individually and in various combinations. This computer program could be modified to increase its flexibility and applicability.

VEHICLE: Modify and utilize existing computer model

AGENCIES: DBEDT; Utilities

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, p, ki, m, h, n, ca, r, z

OPPONENTS:

NO POSITION: w, p, i, krl, ers

Barrier 1.d — Current fuel adjustment clause passes risk of oil price variability to customers.

DEFINITION:

Hawaii's electric utilities have an energy cost adjustment clause (ECAC). It is used to pass on both increases and decreases in the price of fuel oil and the cost of purchased energy to the utility's customers.

DISCUSSION:

In general, the ECAC allows the utility to pass on the risk of price variability to its customers. The theory of those promoting elimination of the ECAC is that it would force the utilities to more fully consider the risk of fuel price volitility in selecting between resources.

There is no consensus that this is a barrier to the development of renewable resources. There is no consensus that the ECAC should be eliminated.

Proponents maintain that elimination of the ECAC would force the acknowledgment of the costs of variable oil prices and the potential for oil price spikes. For example, during the three month period following the August 1, 1990, Iraqi invasion of Kuwait, energy utility prices in Hawaii rose 35% on average statewide, due solely to the oil price spike that took the price of a barrel of crude oil from approximately $20 to $40. Renewable energy resources are not susceptible to extreme oil price variability. This prime advantage, it is argued, is not fully considered by the utilities since the costs of oil price variability are passed on to customers by the ECAC.

Opponents oppose the elimination of the ECAC. Opponents maintain that the ECAC does not constitute a real barrier to the development of renewable resources and that elimination of the ECAC would have undesirable consequences including higher costs to electric customers and the need for more frequent rate cases.

STRATEGIES:

Strategy 1.d.1 PUC eliminate the ECAC on a forward-going basis.

DISCUSSION:

As noted above there is no agreement that the ECAC should be eliminated.

VEHICLE: PUC rulemaking.

AGENCY: PUC.

POSITION OF THE PARTIES:

PROPONENTS: d, p, krl, i, z

OPPONENTS: heco, ke, ki, m, n, ca

NO POSITION: h, w, ers, r

Strategy 1.d.2 Conduct analysis to determine feasibility of establishing a system to help flatten the risk and impacts on ratepayers of oil price variability.

DISCUSSION:

Proponents maintain that an energy cost impact fund could be created, which could accrue funds from a nominal charge per kWh of electricity sold to be retained and administered by the utilities to make up part or all of the marginal difference when petroleum prices fluctuate. A ceiling could be placed on the amount of dollars to be maintained in the fund and the nominal per kWh charge could be suspended once the fund reaches this ceiling. Alternatively, a customer rebate system could also be examined for feasibility. This strategy is very similar to how Japan reduces the impacts of oil price variability on its national economy. If one of the largest economies in the world can do this, it seems that this approach could be feasible to reduce the economic impacts of energy price variability in Hawaii.

Opponents maintain that the need for and benefits of such an approach have not been identified, and that the creation of such a fund would raise the current cost of electricity for customers, could lead to inequities between current and future customers, and could result in "uneconomic" bypass of the utility system by customers desiring to avoid the surcharge necessary to create a fund.

VEHICLE: Work group to develop specific proposal

AGENCY: DBEDT, Other interested agencies

POSITION OF THE PARTIES:

PROPONENTS: ke, d, r, z

OPPONENTS: heco, ca

NO POSITION: n, ki, m, h, w, p, i, krl, ers

Barrier 1.e — Evaluation and consideration of the beneficial impacts of renewable energy use relative to conventional fossil fuel resources.

DEFINITION:

The payment rates for energy and firm capacity purchased by utilities from RE producers are based on the utilities' avoided costs (subject to the minimum floor rates for energy), and (except for the minimum purchase rates) do not include a premium for the relative benefits of RE resources.

DISCUSSION:

There are several different contexts in which the indirect costs and benefits of resource options can be considered. These indirect costs are sometimes referred to as externalities. The possible contexts in which externalities can be considered include (1) the resource selection process used by the utilities in the development of their integrated resource plans, (2) consideration and evaluation of demand-side management programs and (3) the determination of the rates paid to independent power producers ("IPPs").[1] This barrier addresses the last of these possible contexts for the consideration of externalities.

There is no consensus that the extent of evaluation and consideration of the beneficial impacts of renewable energy resources relative to fossil fuel resources in the determination of avoided costs to IPPs is a barrier to the development of renewable resources. There is also no consensus whether these externalities are sufficiently taken into consideration in the determination of the rates paid to IPPs.

Proponents maintain that some renewable resources have beneficial impacts compared to fossil fuel resources and that these benefits are not sufficiently considered in the determination of the avoided cost price paid to renewable resource developers. In order to fully account for these benefits, it is proposed that payments higher than direct avoided costs should be paid to renewable developers.

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[1] The current determination of the avoided cost payment rates is discussed under barrier 1.c. The consideration of RE resources in the utilities' IRP processes is discussed under barriers 1.f., 5.e., and 5.f.

Potential externality benefits of renewables include: (a) a cleaner environment; (b) greater stability in energy prices (renewables, with low or zero fuel costs, can provide a hedge against fuel oil price volatility); (c) enhanced energy security (substantial deployment of renewable technologies could reduce the strategic importance of oil and reduce energy supply risks); and (d) economic benefits."[2]

Opponents maintain that externality costs should not be included in the determination of the avoided costs paid to renewable resource developers, and/or that utilities already pay higher than direct avoided costs for some renewable resources based upon fixed minimum floor rates for purchased energy.[3] Minimum floor rates were required by the legislature in recognition of the desirability of nonfossil fuel resources. Opponents also maintain that there are limitations to state authority to require utilities to pay externality adders or higher than direct avoided costs to nonutility generators.

Externalities and externality adders are addressed by several parties in Appendix B.

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2 The primary environmental benefits are reduced greenhouse gas emissions, reduced risks of oil spills, reduced toxic air emissions, and reduced risks of future environmental regulation. The primary economic benefits are increased employment, reduced supply risk (expressed as an energy security cost), reduced price risk, reduced environmental regulation risk, and improved trade balance. The benefits generally are based on displacing imported fossil fuels used to generate electricity with in-state production of electricity from indigenous renewable energy resources, and are even more compelling if manufacturing of renewable energy conversion systems takes place in-state.

3 Minimum floor rates are discussed under barrier 4.a.

STRATEGIES:

Potential strategies include, but are not limited to:

Strategy 1.e.1 Require utilities to pay an externalities adder above avoided cost.

DISCUSSION:

There is no agreement that externality adders should be required. The topic of externality adders is addressed in Appendix B.

VEHICLE: Establishment of externalities adders in the determination of prices paid to non-utility generators for renewable energy resources.

AGENCY: PUC

POSITION OF THE PARTIES:

PROPONENTS: p, w, n, krl, i, ers

OPPONENTS: heco, ke, h

NO POSITION: ki, m, r, ca

Strategy 1.e.2 Develop and implement a "green pricing" tariff.

DISCUSSION:

Generally, "green pricing" is a utility rate option under which ratepayers would be given the option of paying higher rates in exchange for the utility's commitment to utilize the resulting additional revenues to acquire new renewable resources.

The goal of green pricing is to encourage the development of new renewable resources, and to test customer willingness to pay a higher price for electricity generated from resources that have perceived environmental benefits. Under the green pricing option, customers would optionally pay a marginally higher electric rate over a specified period of time, commonly referred to as a price premium, in exchange for the utility's commitment to utilize the difference to acquire new renewable resources. The price premium could be designed to cover the additional incremental costs of developing the renewable resource relative to conventional fossil fueled utility supply-side resources.

Some perceived benefits associated with green pricing options include:

(1) Assist in the sustained orderly development of renewables;

(2) Customers get renewables over and above what a Least Cost Plan would dictate;

(3) Viewed as a good option to hedge against tightening environmental requirements and global warming concerns; and

(4) Provide an opportunity for customers to voluntarily participate in the development of renewable energy technologies.

Some perceived risks associated with green pricing options include:

(1) the risk of participation in green pricing falling without having generated sufficient revenues to cover the utility's commitment to the new renewable resource,

(2) the risk of the price premium being wrong,

(3) the risk of the fossil fueled supply-side resource avoided cost estimates being wrong,

(4) the risk of program administration costs being too high, especially for smaller systems such as MECO, HELCO, and KE, and

(5) the risk that the utility will have arbitrary authority in determining what RE resources receive a premium on a PPA.

HECO provided the following example of a Pilot Green Pricing Program that it is considering:

1. HECO would include information on green pricing in its Consumer Lines bill insert, and do a series of newspaper advertisements to educate the public on the concept of green pricing.

2. HECO would also conduct a survey of its customers to determine if there is sufficient interest in a green pricing program. The survey would provide necessary information on the type of renewable resources that customers are interested in, and the amount of a price premium and time frame that customers would be willing to commit to under the green pricing option.

3. Based on the survey results, if there appears to be sufficient interest by its customers in green pricing, HECO would proceed with the development of a Pilot Green Pricing Program.

4. The overall basis of the Pilot Green Pricing Program would be to establish a fund for HECO to utilize to acquire new renewable resources. Proceeds from the fund could be used to pay the additional costs of renewable resources over a benchmark avoided cost established for conventional fossil fueled supply-side resources. Provisions could be included for Advisory Group input and/or PUC approval as to how the funds are expended.

5. Once the fund attained a sufficient level, HECO would commence with the acquisition of new renewable resources. If the fund did not achieve a sufficient level to acquire renewable resources, the funds collected to date would be refunded to the contributors.

6. Further details for the Pilot Green Pricing Program would be developed after the survey results have been analyzed and a decision is made by HECO to pursue this strategy.

VEHICLE: Green pricing utility tariff.

AGENCY: HECO Utilities to propose tariff provision for PUC approval. Green Pricing Advisory Group (HECO, HELCO, MECO, KE, CA, DBEDT, PICHTR, RE Developers, Public) to be formed to advise HECO Utilities regarding development of tariff proposal. PUC to review/approve tariff provision.

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, r, p, ki,m, h, n, krl, i, z

OPPONENTS: w

NO POSITION:

Strategy 1.e.3 Consider a production incentive for RE developers funded by a utility customer surcharge.

DISCUSSION:

There is no consensus regarding this strategy.
Production incentives are direct payments to renewable energy developers as incentives for the production of power. For example, the Energy Policy Act of 1992 ("EPACT"), section 1914, provides a 1.5 cent tax credit for each kwh produced by qualifying wind, solar and closed loop biomass facility.

A bill was introduced in the 1994 Legislature (as a "minority" bill resulting from the 1993 Energy and Environmental Summit process) to provide for the establishment of a "Renewable Energy and Energy Storage System Development and Assistance Fund", in order to provide assistance to renewable energy producers and energy storage system developers in the form of a Production Incentive. The bill proposed an initial maximum incentive of 1.5¢/mwh, adjusted quarterly for inflation.

Under the bill, all program costs would be derived from the proceeds of a Renewable Energy/Energy Storage Surcharge on electric utility energy sales. (In contrast, the EPACT production incentive is a tax credit funded by federal taxpayers.) A Production Incentive would be provided to some producers of renewable energy-generated electricity and electricity derived from energy storage systems. A small additional amount (10%) over and above the amount of the Production Incentive would be provided to the utilities for administrative and other associated costs. Utilities, as well as IPPs, would be eligible for the Production Incentive.

The bill was not passed by the 1994 Legislature. However, by SCR 40, SD 1, the Concurrent Resolution which requested the initiation of this docket, the Legislature requested that "particular attention . . . be paid to the production credit proposal developed by the 1993 Energy and Environmental Summit." SCR 40, SD 1 at 5.

While not an explicit avoided cost adder, it is arguable that the placing of the ultimate burden on the ratepayer would run afoul of the apparent FERC prohibition of requiring utility payment to developers in excess of avoided costs.

In lieu of involuntary utility levies, proponents of a production incentive maintain that similar objectives could be satisfied if enough revenue were raised through "green pricing" initiatives (see above) and the funds raised were dedicated to production incentives. Alternative funding methods (e.g., general fund or special tax revenues) could also be investigated.

Opponents of this strategy maintain that (1) the utilities should not be required to levy a surcharge on its customers in order to pay a production credit to renewable energy developers, (2) a surcharge requirement would violate FERC's recent avoided cost cap rulings (see Appendix B, page 13, and (3) taxpayers rather than ratepayers, should pay for any subsidies determined to be appropriate to encourage the development of RE resources. If the utilities pick up the costs, then the impact on ratepayers could be substantial. This would not only have competitive impacts, but would be especially burdensome to utility customers. If the purpose is to provide societal benefits, they should be paid for through taxes (which are generally progressive), rather than through electric rates. At the same time, taxpayers need to be assured that the costs they incur (particularly during periods of fiscal constraints) will produce commensurate benefits.

VEHICLE: An analysis of the potential costs of such a Fund could be made based on ranges of projected development potential and costs of energy for each renewable energy technology. Work conducted by RLA for DBEDT (Resource Supply Curves) would provide a starting point. A determination of whether recent FERC rulings would prohibit the establishment of such a fund should be made.

AGENCIES: DBEDT, RE developers, Utilities, PUC.

POSITION OF THE PARTIES:

PROPONENTS:	d, n, i, p, krl, ers, r, z
OPPONENTS:	heco, ke
NO POSITION:	w, ki, m, h, ca

Barrier 1.f — Inability of utility system operation models and economic models to accurately and adequately model and evaluate renewable energy systems.

DEFINITION:

The models and criteria used by the utilities to determine avoided costs and the need for new generation resources could be improved to more accurately evaluate renewable energy systems.

DISCUSSION:

Computerized "production cost models" are used by the utilities to determine quarterly avoided costs and the comparative costs of various resource options in the IRP process and CIP dockets. Also, the utilities use specific generation expansion criteria to determine the timing and need for new generation resources. Several different methods and models are used by the utilities.

The existing models are primarily designed for the analysis of dispatchable, thermal, fuel-consuming resources. The models are not as easily or effectively adapted to the simulation of intermittent resources with no marginal fuel costs. Existing models can be used to simulate renewable resources, but not without some difficulty and not without some limitations.

One aspect of renewable generation that is not taken into account in current practices with the existing models is the contribution of as-available generation to system reliability. Most renewable generation is "as-available" and is not dispatchable in the same sense as conventional generation. Nonetheless, the availability of as-available energy to the utility system does contribute to system reliability. Neither the production cost models used or the capacity expansion criteria used by the utilities recognize the value of the contribution of as-available energy to system reliability.

Some existing models do quantify the "loss of load probability" and the amount of "energy not served". Both of these parameters are sensitive to the contribution of as-available energy to system reliability. However, these parameters are not currently used as criteria for determining the need for additional generation or in the determination of avoided costs. In this sense the limitation of some of the models is not due to the capabilities of the models themselves, but in the manner in which the models are applied.

A limitation of the methods and models used to determine avoided costs is the convention of assessing only short-term avoided costs for as-available energy resources.[4] Large contributions of as-available IPP-supplied energy could reduce the long-term costs of the least-cost mix of utility resources by affecting the optimum resource mix, even if no capacity value is explicitly ascribed to the as-available energy. For example, with enough as-available energy it would cost less for a utility to build less expensive peaking resources to firm up the as-available energy than it would be to build more capital-expensive fuel-efficient resources. In order to capture the full value of as-available generation resources it is necessary to determine the projected impact of the as-available energy on the long-term optimum resource mix. This type of analysis of long-term avoided costs is conducted in the IRP process, but not in the quarterly determination of short-term avoided costs. Even in the IRP process analyses the full value of as-available generation is not captured to the extent that the models used employ capacity expansion criteria that are not sensitive to the contribution of the as-available energy to system reliability.

Some, but perhaps not all, as-available renewable generation resources may result in a limited amount of deferral or reductions in utility capital costs. To the extent that any such costs can be reasonably demonstrated, including these avoided costs in the selection of resource mix and the negotiation of power purchase contracts would more accurately represent the full value of these renewable resources. (This is discussed under possible barrier 1.c.)

There was consensus that the methodologies for quantitatively valuing the positive (and negative) attributes of renewable resources can be improved. Benefits and risks that can be better evaluated include, but are not limited to, distributed generation benefits, resource diversity benefits, resource supply risk, and technology risk. As part of their Supply-Side Action plans, HECO, HELCO and MECO plan to conduct studies to (1) evaluate opportunities for dispersed generation (and remote or off-line generation facilities on the Big Island), and (2) gather and analyze additional information to permit a more thorough assessment of several of the supply-side options identified in their IRP Supply-Side Resource Reports. An agreement between HECO, HELCO and MECO, and EPRI is in place to conduct dispersed generation studies in their service areas. EPRI's consultant, Rumla, Inc. has conducted screening activities, and is conducting detailed analyses for selected sites. HECO and MECO are working with PICHTR and NREL on an Integrated Electric Utilities Project ("IEUP") -- Model Utility.

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[4] There is a conventional distinction made between short-term and long-term avoided costs. Short term avoided costs include the fuel and operating costs avoided by the operation of a generation resource. Long-term avoided costs also include any capital costs avoided due to deferral of resource additions or changes in optimum resource mix that result from the availability of a generation resource.

STRATEGIES:

Strategy 1.f.1 The PUC should approve the stipulated agreement of the parties and resolve the outstanding issues in Docket No. 7310.

DISCUSSION:

The PUC has conducted a contested case proceeding, Docket No. 7310, to investigate the methods used to determine the quarterly short-term avoided costs used as the basis for payment by the utilities for as-available generation. The parties in the docket have reached a stipulated agreement on most issues and have filed statements of position regarding outstanding issues. The parties were not able to reach agreement regarding the inclusion of externality costs or avoided capacity costs (under special conditions) in the calculation of quarterly short-term avoided costs. The PUC has not yet issued an Order resolving this docket.

The issues addressed in Docket No. 7310 pertain only to regular short-term avoided cost filings. Resolution of these issues would not prohibit utilities or resource developers from using other methods of determining avoided costs in negotiating a power purchase agreement as long as the costs used could be demonstrated to the PUC to be just and reasonable.

Resolution of the issues raised in Docket No. 7310 would clarify many details regarding the calculation of the quarterly short-term avoided costs filed with the PUC. Utilities and resource developers would still be free to use alternate methods of determining reasonable prices in negotiating power purchase contracts.

VEHICLE: Docket No. 7310

AGENCY: PUC

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, p, ki, m, h, w, n, krl, i, r, ca, ers, z

OPPONENTS:

NO POSITION:

Strategy 1.f.2 Consider modeling conventions and generation capacity expansion criteria that are sensitive to the contribution of as-available generation resources towards system reliability.

DISCUSSION:

Use of more sensitive capacity expansion criteria would more accurately reflect the contribution and value of non-conventional generation resources towards utility system reliability.

There is consensus that it may be possible to improve generation expansion criteria by making them sensitive, or more sensitive (in the case of HECO[5]), to load demand. The use of probabilistic criteria has more merit in the case of dispatchable resources that are not available 24 hours a day. An example would be a battery energy storage plant, which might be available only 1-3 hours a day. There is also consensus that the issues of renewables modeling and capacity expansion criteria should be further addressed (with Advisory Group input) in the IRP processes in the utilities' next IRP Plan cycles, which are beginning at this time.

VEHICLE: Generation Capacity Expansion Criteria, IRP process, Power purchase contract negotiations

AGENCY: Utilities, Renewable developers, PUC, Consumer Advocate, DBEDT, PICHTR, NREL, EPRI

POSITION OF THE PARTIES:

PROPONENTS: heco, ke, d, p, ki, m, h, n, i, ers, w, ca, r, krl, z

OPPONENTS:

NO POSITION:

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5 The HECO Utilities generally apply deterministic generation expansion criteria (reserve margin, loss of largest unit, etc.), although HECO does give consideration to a loss load probability ("LOLP") criteria of 4.5 years per day.